

REMARKS

Favorable reconsideration and withdrawal of the rejections set forth in the above-mentioned Official Action in view of the foregoing amendments and the following remarks are respectfully requested.

Claims Status

Claims 8 and 10 through 13 remain pending in the application. Claims 8 and 10 have been amended to even more succinctly define the invention and/or to improve their form. It is respectfully submitted that no new matter has been added. Claim 8 is the only independent claim pending in the application.

Art Rejections

Claims 8 and 10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,994,853 (Fukuchi, et al.) in view of U.S. Patent No. 5,300,987 (Aoyama, et al.).

Claims 11 through 13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Fukuchi, et al. in view of U.S. Patent No. 5,229,821 (Fujii).

The rationale underlying each of the foregoing art rejections is succinctly set forth in the Official Action.

Response to Art Rejections

The rejections are respectfully traversed.

Amended Claim 8 calls for An image forming apparatus that includes a rotatable image bearing member on which an electrostatic image is to be formed;

a first developer carrying member, which carries and conveys a developer, and develops the electrostatic image on the image bearing member by a developing bias being

applied to the first developer carrying member; two first regulating members, which are disposed on both sides in a longitudinal direction of the first developer carrying member, respectively, and which regulate a gap between the image bearing member and the first developer carrying member with the two first regulating members abutting against the image bearing member; a second developer carrying member, which is disposed downstream of the first developer carrying member in a rotating direction of the image bearing member, carries and conveys a developer, and develops again the electrostatic image developed by the first developer carrying member by a developing bias being applied to the second developer carrying member; two second regulating members, which are disposed on both sides in a longitudinal direction of the second developer carrying member, respectively, abut against two peripheral surface areas of the image bearing member different from two peripheral surface areas of the image bearing member against which the two first regulating members abut, and which regulate a gap between the image bearing member and the second developer carrying member; and pressing means for pressing the first developer carrying member and the second developer carrying member toward the image bearing member. The two peripheral surface areas of the image bearing member against which the two second regulating members abut are inside the two peripheral surface areas of the image bearing member against which the two first regulating members abut in a longitudinal direction of the image bearing member.

According to amended Claim 8, variations in the gaps between two developer carrying members and an image bearing member are reduced to obtain a stable image.

A variation in a gap between a developer carrying member and an image bearing member is a factor affecting the development performance. Such variations may occur due

to abrasion wear of a surface area of the image bearing member abutting against a regulating member and a deflection of the developer carrying member as a result of a contact pressure. Greater abrasion wear of the surface area results in a smaller gap. Greater deflection results in a greater difference in a gap in the longitudinal direction. Therefore, the development performance varies so as to change image quality.

Developing the same electrostatic image may be performed by two developer carrying members. First, a rough development is performed by an upstream first developer carrying member, and then image quality is adjusted by a downstream second developer carrying member. In such a development mechanism, the image quality is finally determined by the downstream second developer carrying member.

To avoid the above-noted problems, amended Claim 8 includes the feature that “two second regulating members abut against two peripheral surface areas of said image bearing member different from two peripheral surface areas of said image bearing member against which said two first regulating members abut.” This feature avoids the excessive abrasion wear of the surface of the image bearing member so as to reduce the variation in the gap.

Furthermore, amended Claim 8 includes the feature that “the two peripheral surface areas of said image bearing member against which said two second regulating members abut are inside the two peripheral surface areas of said image bearing member against which said two first regulating members abut in a longitudinal direction of said image bearing member.” This feature makes the deflection of the second developer carrying member, which has a greater influence on the image quality smaller than the deflection of the first developer carrying member so as to reduce the variation in image quality. This is

because the shorter the distance between the two regulating members, the shorter the span between the two regulating members, and the amount of deflection of the second carrying member is reduced. According to the invention of amended Claim 8, the span of the second developer carrying member is shortened compared to the span of the first developer carrying member so as to reduce the amount of deflection of the second developer carrying member.

Fukuchi, et al. discloses a plurality of developing devices 31X, 31Y, and 31Z, wherein each developing device is supported by a pair of guide members 4. However, the guide members 4 of Fukuchi, et al. are not disposed on both sides of the developer carrying member in the longitudinal direction. Also, the guide member 4 do not abut against a photoreceptor drum 30. See Figure 1-b.

Fukuchi, et al. does not disclose or suggest the feature that “two second regulating members abut against two peripheral surface areas of said image bearing member different from the two peripheral surface areas of said image bearing member against which said two first regulating members abut.” Accordingly, Fukuchi, et al. does not disclose or suggest the technical advantages of the claimed arrangement, which avoids excessive abrasion wear of the surface of the image bearing member to reduce variations in gap.

Furthermore, Fukuchi, et al. does not disclose or suggest the technical advantage of making the deflection of the second developer carrying member, which has a greater influence on the image quality smaller than the deflection of the first developer carrying member so as to reduce the variation in image quality. This advantage results from the claimed feature that “the two peripheral surface areas of said image bearing member

against which said two second regulating members abut are inside the two peripheral surface areas of said image bearing member against which said two first regulating members abut in a longitudinal direction of said image bearing member.”

Aoyama, et al. discloses spacer rollers 19 and 20 provided on a developing sleeves 15, respectively, which are positioned with respect to a photosensitive drum 3 by the spacer rollers 19 and 20 abutting against the photosensitive drum 3. See Figure 3. However, the abutment state of the spacer rollers 19 and 20 of Aoyama, et al. is only shown in a sectional view of the apparatus shown in Figure 3. Aoyama, et al. does not disclose or suggest any position of abutment in a rotational axial direction of the photosensitive drum 3.

Furthermore, Aoyama, et al. does not disclose or suggest addressing the problem that a first regulating member and a second regulating member may abut against an image bearing member may cause local excessive abrasion wear of the image bearing member. Accordingly, Aoyama, et al. does not disclose or suggest the claimed feature that “two second regulating members abut against two peripheral surface areas of said image bearing member different from two peripheral surface areas of said image bearing member against which said two first regulating members abut” in order to solve the problem.

In addition, Aoyama, et al. does not disclose or suggest the technical advantages of making the deflection of the second developer carrying member, which has a greater influence on the image quality smaller than the deflection of the first developer carrying member so as to reduce the variation in image quality. As above-noted, the advantage results from the claimed feature that “the two peripheral surface areas of said image bearing member against which said two second regulating members abut are inside the two

peripheral surface areas of said image bearing member against which said two first regulating members abut in a longitudinal direction of said image bearing member.”

It is again respectfully submitted that the combination rejection is not well founded. The Examiner asserts that both Fukuchi, et al. and Aoyama, et al. are in similar arts and there is motivation to modify Fukuchi, et al. with the teachings of Aoyama, et al. to regulate a gap between a developer carrying member and an image bearing member. However, such a gap may be regulated in a variety of manners. There is nothing in either Fukuchi, et al. or Aoyama, et al. *per se* to suggest that the teachings of Fukuchi, et al. should be modified by the teachings of Aoyama, et al.. Accordingly, a *prima facie* case of obviousness has not been established.

In view of the foregoing, it is respectfully submitted that independent Claim 8 is allowable over the cited art whether taken individually or in combination.

Dependent Claims

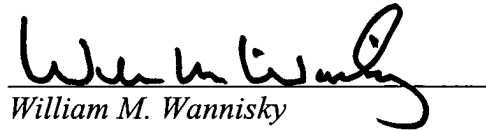
Claims 10 through 13 depend either directly or indirectly from Claim 8 and are allowable by virtue of their dependency and in their own right for further defining Applicant's invention. Individual consideration of the dependent claims is respectfully requested.

Closing Comments

It is respectfully submitted that the pending claims are allowable over the art of record and that the application is in condition for allowance. Favorable reconsideration and early passage to issue of the present application are earnestly solicited.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our New York office at the address shown below.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "William M. Wannisky", is written over a horizontal line.

William M. Wannisky
Attorney for Applicant
Registration No. 28,373

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-3801
Facsimile: (212) 218-2200

WMW\tas

DC_MAIN 241316v1